

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended) An apparatus for preventing unauthorized copying of printed contents printed on printing paper, said apparatus comprising:

acquisition means for acquiring pattern information according to ~~[[the]]~~ a pattern carried by the printing paper, the acquisition means including

image pickup means for shooting the pattern,

dividing means for dividing a pattern image, obtained as a result of the shooting of the pattern by the image pickup means, into a low luminance component and a high luminance component and separating the low luminance component and high luminance component from each other, and

extraction means for extracting the pattern information from the pattern image, the extraction means extracting the pattern information from the low luminance component and the high luminance component separated from each other;

storage means for storing the pattern information acquired by the acquisition means on the printing paper; and

verification means for verifying ~~[[the]]~~ validity of the printing paper according to the pattern information stored by the storage means.

Claim 2 (Currently Amended) The apparatus according to claim 1, wherein said acquisition means includes:

~~image pickup means for shooting the pattern; and~~

~~extraction means for extracting the pattern information from the pattern image  
obtained as a result of the shooting by the image pickup means; the~~

extraction means being adapted to ~~extract~~ for extracting the pattern information from  
a low range frequency component.

Claim 3 (Canceled).

Claim 4 (Currently Amended) The apparatus according to claim 1 ~~[[3]]~~, wherein the  
extraction means ~~is adapted to divide~~ divides the pattern image into ~~[[a]]~~ the low luminance  
component and ~~[[a]]~~ the high luminance component so as to make them show a given area  
ratio relative to the pattern image.

Claim 5 (Currently Amended) The apparatus according to claim 1, wherein said  
acquisition means includes:

~~image pickup means for shooting the pattern; and~~

~~extraction means for extracting the pattern information from the pattern image  
obtained as a result of the shooting by the image pickup means; the~~

~~extraction means being adapted to divide~~ dividing means for dividing the pattern  
image so as to define a plurality of regions, and ~~extract~~

extracting means for extracting pattern information from each of the defined regions.

Claim 6 (Currently Amended) The apparatus according to claim 1, wherein said  
acquisition means includes:

~~image pickup means for shooting the pattern; and~~  
~~extraction means for extracting the pattern information from the pattern image~~  
~~obtained as a result of the shooting by the image pickup means; the~~  
~~extraction means being adapted to divide~~ dividing means for dividing the pattern  
image so as to define a plurality of regions, and ~~extract~~  
extracting means for extracting a characteristic quantity from each of the defined  
regions as pattern information.

Claim 7 (Currently Amended) The apparatus according to claim 1, wherein the  
verification means is ~~adapted to correct~~ corrects the pattern information, ~~if necessary,~~ and  
~~verify the~~ verifies validity of the printing paper according to the corrected pattern  
information.

Claim 8 (Currently Amended) The apparatus according to claim 1, wherein said  
acquisition means includes:

~~image pickup means for shooting the pattern; and~~  
~~extraction means for extracting the pattern information from the pattern image~~  
~~obtained as a result of the shooting by the image pickup means; the~~  
~~extraction means being adapted to divide~~ dividing means for dividing the pattern  
image so as to define a plurality of regions, and ~~extract~~  
extracting means for extracting a characteristic quantity from each of the defined  
regions as pattern information, wherein [[:]]

the verification means ~~being adapted to correct~~ corrects the pattern information, ~~if necessary, and verify the~~ verify validity of the printing paper according to the corrected pattern information.

Claim 9 (Currently Amended) A method for preventing unauthorized copying of printed contents printed on printing paper, said method comprising:

a first step of acquiring pattern information according to ~~[[the]]~~ a pattern carried by the printing paper, the first step including

shooting the pattern,

dividing a pattern image, obtained as a result of the shooting of the pattern,  
into a low luminance component and a high luminance component and separating the  
low luminance component and high luminance component from each other, and

extracting the pattern information from the pattern image by extracting the  
pattern information from the low luminance component and the high luminance  
component separated from each other;

a second step of storing the acquired pattern information on the printing paper; and

a third step of verifying ~~[[the]]~~ validity of the printing paper according to the stored pattern information.

Claim 10 (Currently Amended) ~~A program for causing a control device to execute a~~  
~~program~~ non-transitory computer-readable medium storing computer readable instructions  
thereon that when executed by a control device cause the control device to perform a method  
comprising:

~~a first process of extracting~~ acquiring pattern information according to ~~[[the]]~~ a pattern ~~from the image information acquired as a result of shooting the pattern~~ carried by printing paper ~~[[also]]~~ carrying predetermined contents;

shooting the pattern;

dividing a pattern image, obtained as a result of the shooting, into a low luminance component and a high luminance component and separating the low luminance component and high luminance component from each other; and

extracting the pattern information from the pattern image by extracting the pattern information from the low luminance component and the high luminance component separated from each other;

~~a second process of~~ storing the extracted pattern information on the printing paper;  
and

~~a third process of~~ verifying ~~[[the]]~~ validity of the printing paper according to the pattern information stored on the printing paper.

Claim 11 (Currently Amended) An apparatus for preventing unauthorized copying of printed contents printed on printing paper, said apparatus comprising:

image pickup means for picking up an image of ~~[[the]]~~ a pattern carried by the printing paper;

~~extraction means~~ dividing means for dividing the pattern image obtained as a result of ~~[[the]]~~ an image pickup operation of the image pickup means to define regions of a predetermined unit, ~~[[and]]~~

extracting means for extracting each of the regions ~~obtained as a result of the division~~ as pattern information and showing a predetermined profile as pattern information;

storage means for storing the pattern information extracted by the extraction means on the printing paper; and

verification means for verifying ~~[[the]]~~ validity of the printing paper according to the pattern information stored by the storage means.

Claim 12 (Currently Amended) The apparatus according to claim 11, wherein the extraction means ~~is adapted to extract~~ extracts pattern information showing each of the regions as a circle.

Claim 13 (Currently Amended) The apparatus according to claim 11, wherein the extraction means ~~is adapted to extract~~ extracts pattern information showing each of the regions with a profile that varies as a function of ~~[[the]]~~ a size of the region.

Claim 14 (Currently Amended) A method for preventing unauthorized copying of printed contents printed on printing paper, said method comprising:

a first step of picking up an image of ~~[[the]]~~ a pattern carried by the printing paper;

a second step of dividing ~~[[the]]~~ a pattern image obtained as a result of ~~[[the]]~~ an image pickup operation to define a plurality of regions, ~~[[and]]~~

extracting each of the regions ~~obtained as a result of the division~~ as pattern information and showing a predetermined profile as pattern information;

a third step of storing the extracted pattern information on the printing paper; and

a fourth step of verifying [[the]] validity of the printing paper according to the stored pattern information.

Claim 15 (Currently Amended) ~~A program for causing a control device to execute a~~  
~~program~~ non-transitory computer-readable medium storing computer readable instructions  
thereon that when executed by a control device cause the control device to perform a method  
comprising:

~~a first process of~~ dividing [[the]] a pattern image obtained as a result of [[the]] an  
image pickup operation to define a plurality of regions;

~~a second process of~~ extracting each of the regions ~~obtained as a result of the division~~  
as pattern information and showing a predetermined profile as pattern information;

~~a third process of~~ storing the extracted pattern information on [[the]] printing paper;  
and

~~a fourth process of~~ verifying [[the]] validity of the printing paper according to the  
pattern information stored on the printing paper.

Claim 16 (Withdrawn – Currently Amended): An apparatus for preventing  
unauthorized copying of printed contents printed on printing paper, said apparatus  
comprising:

image pickup means for picking up an image of [[the]] a pattern carried by the  
printing paper, the image pickup means including shooting the pattern;

dividing means for dividing a pattern image, obtained as a result of the shooting of the  
pattern by the image pickup means, into a low luminance component and a high luminance

component and separating the low luminance component and high luminance component from each other, and

extraction means for extracting characteristics of the pattern image picked up by the image pickup means, the extraction means extracting the characteristics from the low luminance component and the high luminance component separated from each other;

storage means for storing the characteristics extracted by the extraction means on the printing paper; and

verification means for reconfiguring the pattern image according to the characteristics stored by the storage means and verifying [[the]] validity of the printing paper according to [[the]] a reconfigured pattern image.

Claim 17 (Withdrawn – Currently Amended): The apparatus according to claim 16, wherein

the extraction means ~~is adapted to extract~~ extracts pixels showing a predetermined luminance value, [[;]] and

the verification means ~~is adapted to reconfigure~~ reconfigures the pattern image by generating a plurality of regions in a predetermined luminance state by referring to the pixels.

Claim 18 (Withdrawn – Currently Amended): The apparatus according to claim 17, wherein the extraction means ~~is adapted to extract~~ extracts pixels showing a predetermined luminance value out of [[the]] a low frequency component image of the pattern image.



Claim 19 (Withdrawn – Currently Amended): The apparatus according to claim 17, wherein the verification means ~~is adapted to generate~~ generates a plurality of small regions by dividing ~~[[the]]~~ a region containing ~~[[the]]~~ pixels by using Voronoi division and ~~determine~~ determines the luminance state of each of the small regions~~[[,]]~~ using the luminance values of the pixels.

Claim 20 (Withdrawn – Currently Amended): The apparatus according to claim 17, wherein the verification means ~~is adapted to generate~~ generates a plurality of regions~~[[,]]~~ using the pixels as reference points, and ~~determine~~ determines the luminance state of each of the regions~~[[,]]~~ using the luminance values of the reference points so as to make the luminance state between the reference points in neighboring ~~ones of the~~ regions mild.

Claim 21 (Withdrawn – Currently Amended): A method for preventing unauthorized copying of printed contents printed on printing paper, said ~~apparatus~~ method comprising:

a first step of picking up an image of ~~[[the]]~~ a pattern carried by the printing paper by shooting the pattern;

a second step of dividing a pattern image, obtained as a result of the shooting of the pattern, into a low luminance component and a high luminance component and separating the low luminance component and high luminance component from each other, and

a ~~second~~ third step of extracting characteristics of the pattern image ~~obtained as a result of the image pickup operation~~ by extracting the characteristics from the low luminance component and the high luminance component separated from each other;

a ~~third~~ fourth step of storing the extracted characteristics on the printing paper; and

a ~~fourth~~ fifth step of reconfiguring the pattern image according to the stored characteristics and verifying ~~[[the]]~~ validity of the printing paper according to ~~[[the]]~~ a reconfigured pattern image.

Claim 22 (Withdrawn – Currently Amended): The method according to claim 21, wherein

pixels showing a predetermined luminance value are extracted from the pattern image as the characteristics in the first step, ~~[[;]]~~ and

the pattern image is reconfigured by generating a plurality of regions showing a predetermined luminance state~~[[,]]~~ using the pixels as reference in the ~~fourth~~ fifth step.

Claim 23 (Withdrawn – Currently Amended): The method according to claim 22, wherein the pixels showing a predetermined luminance value are extracted from ~~[[the]]~~ a low frequency component image of the pattern image as the characteristics in the first step.

Claim 24 (Withdrawn – Currently Amended): The method according to claim 22, wherein a plurality of small regions are generated by dividing the regions containing ~~[[the]]~~ pixels by using Voronoi division and the luminance states of the small regions are determined by using the luminance values of the pixels in the ~~fourth~~ fifth step.

Claim 25 (Withdrawn – Currently Amended): The method according to claim 22, wherein a plurality of regions are generated by using the pixels as reference points and the luminance state of each of the regions ~~are so~~ is determined by using the luminance values of

the reference points so as to make the luminance state between the reference points in neighboring ~~ones of the~~ regions mild in the ~~fourth~~ fifth step.

Claim 26 (Withdrawn – Currently Amended): A ~~program for causing a control device to execute a program~~ non-transitory computer-readable medium storing computer readable instructions thereon that when executed by a control device cause the control device to perform a method comprising:

acquiring pattern information according to a pattern carried by printing paper carrying predetermined contents;

shooting the pattern

dividing a pattern image, obtained as a result of the shooting, into a low luminance component and a high luminance component and separating the low luminance component and high luminance component from each other; and

a first process of extracting characteristics of the pattern image by extracting the pattern information from the low luminance component and the high luminance component separated from each other ~~obtained as a result of the image pickup operation;~~

~~a second process of~~ storing the extracted characteristics on the printing paper; and

~~a third process of~~ reconfiguring the pattern image according to the stored characteristics; and

~~a fourth process of~~ verifying [[the]] validity of the printing paper according to the reconfigured pattern image.

Claims 27 - 33 (Canceled).

Claim 34 (New): An apparatus for preventing unauthorized copying of printed contents printed on printing paper, said apparatus comprising:

an acquisition unit configured to acquire pattern information according to a pattern carried by the printing paper, the acquisition unit including

an image pickup unit configured to shoot the pattern,

a dividing unit configured to divide a pattern image into a low luminance component and a high luminance component and separate the low luminance component and high luminance component from each other

an extraction unit configured to extract the pattern information from a pattern image obtained as a result of the shooting by the image pickup unit, the extraction unit extracting the pattern information from the low luminance component and the high luminance component separated from each other;

a storage unit configured to store the pattern information acquired by the acquisition unit on the printing paper; and

a verification unit configured to verify validity of the printing paper according to the pattern information stored by the storage unit.